



Exterior Door Inspection: *Will These Doors Leak?*

A Closer Look at Hinges, Thresholds and Sweeps

By DYLAN CHALK, ACI

After ten years of inspecting in the rainy Pacific Northwest, I have concluded that there are only two kinds of exposed exterior doors around here: those that leak and those that are going to leak.

WHILE EXCEPTIONS CAN BE FOUND, they are primarily a function of exposure — doors installed below generous roof overhangs and on north faces are often safe, but doors exposed to the weather in our climate are not to be trusted. While anyone can spot obvious leakage, a more nuanced understanding of exterior door installation helps me get a sense of how the door may perform after I leave the inspection. While our standards state that we are only reporting on conditions at the time of inspection, this is one area where future problems can be spotted and headed off if you know what to look for. At the very least, you can alert your client to some potential moisture and security problems by simply taking in a few small details.

DOOR SWING. One of the most obvious questions when looking at an exterior door is: Does the door swing in or out? Exterior doors can be made to swing either outward or inward. Doors that are designed to swing out tend to have a better threshold design to shed the water that drains off the door (see photos on the next

page where an in-swing door had water leaking under the sweep). A door that is designed to swing outward will almost always perform better in terms of preventing water entry than a door that is made to swing inward.

I commonly find three different types of out-swinging doors:

1: Exterior-rated hinges to the weather and correct threshold orientation. This is a secure and correct installation when hinges are corrosion-resistant and include some kind of security feature to prevent removal of the pin.

2: Interior-rated hinges to the weather with correct threshold orientation. This threshold may work, but the door sometimes is unsecure and hinges could rust and possibly leak.

3: Interior-rated hinges to the weather with incorrect threshold orientation. This incorrectly installed type of exterior door will almost always leak when exposed to the weather and is unsecure.

After I have established what type of installation I am looking at, I turn my attention to the threshold, hinges and sweeps.



The photo above left shows a door swinging in. Water has been running down the door and wicking under the door sweep. Above right, the photo shows water-stained carpet. This house was built in 2006. This door appeared to be installed with correct threshold orientation but was still leaking — perhaps a better sweep would have kept the water out? Note the flat sill outside and wood threshold with reverse-slope — a likely problem.



The two photos at the left are from a house constructed in 2013 — regular interior hinges to the weather and sloped threshold faces inside. I explained to the client that the door appears backward and poses a security risk as well as unpredictable performance. I recommended installing a proper out-swinging door with exterior-rated hinges.

THE THRESHOLD. Look to see if the door even has a threshold — doors with missing thresholds are certain to leak. Check the orientation of the threshold: Does the side of the threshold designed for the outside appear to be on the inside? This is a tell-tale sign of a door hung backward. Outside, look for water collecting



on the top of the threshold and causing wood decay in the base of the jamb material — this is

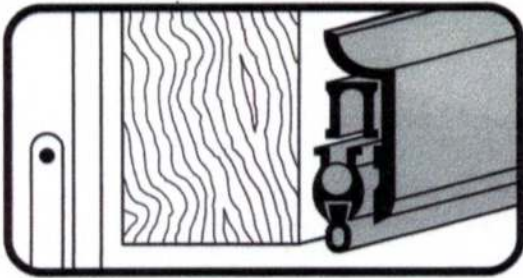
common on exposed doors with the metal thresholds and softwood jambs. Also, is the threshold adequately sloped to drain? Finally, look to see if the threshold is level across the width of the door and is well secured: Does the threshold move and flex when walked on? Is it bowed? ▶▶



The photo above and the photo at the top of page 10 show a high-end out-swing commercial storefront door. This was very exposed but well-engineered. The sweep on this door locks into the threshold, and the hinges have a weather-proof cover.

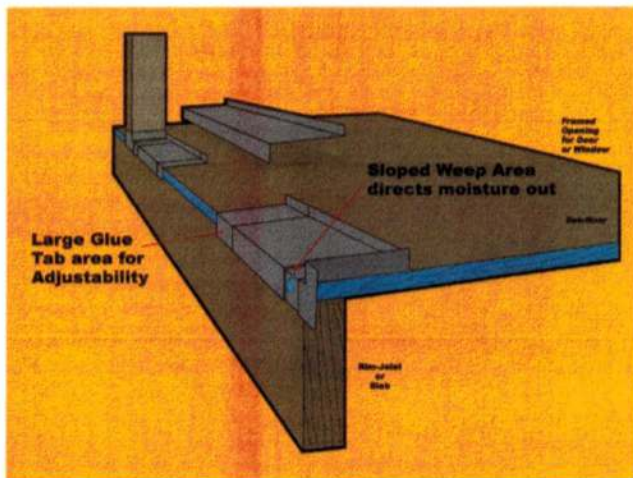
The inset photo at the left shows typical wood rot developing in the base of a softwood jamb where water wicks into end grain.

▶▶ Exterior door inspection



The diagram above shows an example of a retractable door sweep that will push down to meet the threshold when the door closes. (M-D Building Products 7039 Seal-O-Matic™ Door Sweep™, 36 inches, aluminum)

The photo on right shows a storm door protecting an exposed in-swing side door.



The diagram at the far left shows a Jamsill Guard™ product – an adjustable sill pan flashing for doors and windows. Illustration courtesy of Jamsill Guard.



The photo at right shows water intrusion below carpet adjacent to this basement-well door. Right side shows a storm door installed.

THE HINGES. If the hinges are to the weather, look to see if they are regular hinges or exterior-rated hinges. Exterior hinges are typically made from stainless steel or brass and are resistant to rust — these are called NRP hinges. NRP hinges cannot have the pins removed unless the door is halfway open; thus they are secure. Regular hinges exposed to the weather are a security hazard — the door could be removed by removing a few pins.

THE SWEEP. There are many different door sweeps, and they are hard to inspect because they are below the door and barely visible. I have not been able to find a correlation between specific types of door sweeps and door leakage — rather threshold orientation and hinge exposure are a more telling clue for me. If the door has no sweep, that is a problem — the door

needs to fit tightly to the threshold. Check for damage on any door sweep that could compromise the sweep. One sweep you may run into is a retractable door sweep that pushes down onto the threshold when the door closes — these are generally designed to prevent air leakage and create a thermal break and will not necessarily weather-proof an exposed door. If you see an exposed and vulnerable in-swing door you can recommend a nice storm door system to keep the weather out.

SILL PAN FLASHING. Sill pan flashings are critical to keeping the building materials below an exposed door dry. These are typically not visible to inspection, so you will likely have a difficult time determining if one has been installed or what materials were used below the door. Some doors that come pre-hung will

offer a custom sill pan flashing as an option to install below the threshold; other sill pan flashings are available that can be custom fit on-site to any door — see the diagram of the Jamsill Guard™ above. Many builders in this part of the country simply wrap the door opening below the threshold with Vycor™ — this is a membrane used commonly around window and door openings. Practices may vary around the country. It would be wise to contact a local builder to see what steps they take in exterior door weather-proofing so you have an idea what is standard in your area.

TESTING PROCEDURES. Open the door completely and if it is a double-hung French door, open both doors. Look at the base of the door and jamb for water stains or wood decay. Feel the flooring inside. Have the hardwoods

cupped? Do you get high moisture meter readings? If there is carpet inside, I will often use needle nose pliers and look below the carpeting to see if tack strip or subfloor is stained or damaged. MDF (medium density fiberboard) trim is your friend — look for swelling adjacent to the door.

There are many other things to look for in exterior doors, but my focus here was a couple of basic tips regarding exterior doors, moisture and security. I hope you find these tips helpful, and I would be glad to receive any comments and tips about what you have noted during your exterior-door inspections. ■

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